

## ABSTRACT

5 A computer-assisted process for the design and placement of multi-colored patterns  
on absorbent substrates using a limited number of transparent process colorants is  
described. Through use of this system, a designer, working with a computer-aided  
design system, can generate and accurately represent on a computer monitor or  
similar display a multi-colored pattern, as that pattern would appear on a specified  
10 absorbent substrate, using coloring elements comprised of groups of multiple pixels  
in which process colors have been mixed in a controlled manner to expand the range  
of available colors, and to compensate for colorant delivery limitations that prevent  
the application of small, accurately metered quantities of colorant. Actuation  
instructions for a specific dye injection machine capable of patterning a moving  
15 textile substrate may be generated.

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